

Revised Draft Environmental Impact Statement/  
Environmental Impact Report

# Truckee River Operating Agreement

---

## Executive Summary

California and Nevada

August 2004

United States Department of the Interior  
Bureau of Reclamation  
Fish and Wildlife Service  
Bureau of Indian Affairs

State of California  
Department of Water Resources

# Executive Summary

---

**Federally endangered cui-ui**



**Federally threatened Lahontan cutthroat trout**



# EXECUTIVE SUMMARY

## INTRODUCTION

In February 1998, the U.S. Department of the Interior (Interior) and State of California (California) Department of Water Resources (CDWR) jointly issued a draft environmental impact statement/environmental impact report (DEIS/EIR) evaluating a draft Truckee River Operating Agreement (TROA). That agreement was based on elements that negotiating parties tentatively agreed to in May 1996. Negotiations continued after the DEIS/EIR was released, and many elements of that agreement have been revised in another Draft Agreement<sup>1</sup> issued in October 2003.

This revised DEIS/EIR, again prepared jointly by Interior and California, describes (1) TROA, the proposed action alternative, which is reservoir operations under the October 2003 Draft Agreement; (2) an alternative to the Draft Agreement, the Local Water Supply Alternative (LWSA); (3) a No Action Alternative (No Action); and (4) current conditions. (The alternatives are based upon conditions assumed to exist in the study area when the annual demand for Truckee Meadows Water Authority's [TMWA] municipal and industrial [M&I] water in the Reno-Sparks metropolitan area [Truckee Meadows] is 119,000 acre-feet—the year 2033, based upon current population projections. Current conditions is based on documented statistics from the year 2002.) This document also describes the status of resources of the study area and presents an evaluation of the potential effects of the alternatives on these resources. The study area includes the Truckee River basin in northeastern California and northwestern Nevada, the Truckee Division of the Newlands Project, Lahontan Reservoir, and the lower Carson River basin in northwestern Nevada.

The proposed action is the signing, adoption, and implementation of the Agreement by the Secretary of the Interior (Secretary) and California, including promulgation of TROA as a Federal rule; changing of California water rights permits and licenses to allow the water storage, transfers, and exchanges provided for in the Agreement; and negotiating contracts with the owners of Credit Water created pursuant to the Agreement for storage of that water in Federal reservoirs.

The primary purpose of the proposed action is to implement section 205(a) of Public Law (P.L.) 101-618, which directs the Secretary to negotiate an agreement with California and the State of Nevada (Nevada) to increase the operational flexibility and efficiency of certain reservoirs in the Lake Tahoe and Truckee River basins. The proposed action would provide additional opportunities to store water in existing reservoirs for future M&I demands during periods of drought conditions in Truckee Meadows, and enhance spawning flows in the lower Truckee River for the benefit of Pyramid Lake fishes (i.e., federally endangered cui-ui and threatened Lahontan cutthroat trout [LCT]). In addition, it would satisfy all applicable

---

<sup>1</sup> For the purposes of this revised DEIS/EIR, the draft document, Truckee River Operating Agreement, is referred to as the "Draft Agreement;" the commonly used acronym, TROA, refers to the proposed action alternative.

dam safety and flood control requirements and ensure that water is stored in and released from Truckee River reservoirs to satisfy the exercise of *Orr Ditch* and *Truckee River General Electric* Decree water rights and minimize the Secretary's costs associated with operating and maintaining Stampede Reservoir. It would also increase recreational opportunities in the Federal reservoirs, improve streamflows and fish habitat throughout the Truckee River basin, and improve water quality in the Truckee River.

The proposed action would satisfy the terms, conditions, and contingencies of the Preliminary Settlement Agreement as Modified by the Ratification Agreement (PSA) by changing the operation of Truckee River storage facilities and exercise of Truckee River water rights in order to improve spawning conditions for Pyramid Lake fishes and to provide water to serve Truckee Meadows during drought periods as required by section 205(a). The Agreement's entry into effect would trigger certain provisions of P.L. 101-618 also to become effective, including the California-Nevada Interstate Allocation (section 204 of P.L. 101-618) of waters of the Lake Tahoe and Truckee River basins, and the confirmation of the *Alpine* Decree as part of the interstate allocation for the Carson River basin.

A number of statutory and regulatory procedures must be completed before TROA can be implemented. The National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) process must be completed before any final Agreement can be approved by the Secretary and California. The other mandatory signatory parties—Nevada, Pyramid Lake Paiute Tribe of Indians (Pyramid Tribe), and Sierra Pacific Power Company (Sierra Pacific)—must also approve TROA. To enter into effect, TROA must be promulgated as a Federal regulation and published in the Federal Register. TROA must also be submitted to the U.S. district courts that supervise and administer the *Orr Ditch* and *Truckee River General Electric* Decrees<sup>2</sup> for approval of any necessary modifications in the provisions of those decrees.

This EIS/EIR will satisfy NEPA/CEQA requirements for storage contracts. The California State Water Resources Control Board (SWRCB) may consider the final EIS/EIR in determining whether and how to approve any water rights applications or change petitions submitted pursuant to TROA.

P.L. 101-618 requires the dismissal of five specific Truckee River lawsuits with prejudice, or other final resolution, before TROA and other specified provisions—PSA, Pyramid Lake Paiute Economic Development Fund, and interstate allocations between Nevada and California of the waters of Lake Tahoe, the Truckee River, and the Carson River—become effective concurrent with development of a TROA which is acceptable to the mandatory signatories: the Secretary, Nevada, California, and the parties to PSA (Sierra Pacific and Pyramid Tribe). Also, TROA would accommodate changes to Newlands Project Operating Criteria and Procedures (OCAP) to allow Newlands Project Credit Water operations as provided in TROA.

---

<sup>2</sup> The U.S. district courts that supervise and administer the *Truckee River General Electric*, *Orr Ditch*, and *Alpine* Decrees also are referred to as the *Truckee River General Electric*, *Orr Ditch*, and *Alpine* courts, respectively, in this document.

## BACKGROUND

Most of the runoff in the Truckee River basin originates in the Sierra Nevada in California. A portion of that runoff is stored in Federal reservoirs—Lake Tahoe and Prosser Creek, Stampede, Boca, and Martis Creek Reservoirs—and non-Federal reservoirs—Donner and Independence Lakes—located in California (and a portion of Lake Tahoe is in Nevada). Operation of these reservoirs regulates much of the flow in the Truckee River basin in most years. These reservoirs together can store about a million acre-feet of water. A number of court decrees, agreements, and regulations govern day-to-day operations of these reservoirs, administered by the Federal Water Master for the *Orr Ditch* and *Alpine* courts. The reservoirs are operated to capture runoff as available when flow in the river is greater than that needed to serve downstream water rights in Nevada and to maintain prescribed streamflows in the Truckee River, known as Floriston Rates, measured at the Farad gauge near the California-Nevada State line. Floriston Rates provide water to serve hydropower generation, M&I use in Truckee Meadows, flow, and agricultural water rights. In general, each reservoir currently has authorization to serve specific uses. Releases are made from the reservoirs as necessary to meet dam safety or flood control requirements and to serve water rights when unregulated flow cannot be diverted to serve those rights. Minimum reservoir releases are maintained as specified in applicable agreements and the reservoir licenses.

## ALTERNATIVES DEVELOPMENT

The proposed action, TROA, is the result of 13 years of negotiations among representatives of the United States, California, Nevada, Pyramid Tribe, Sierra Pacific, TMWA, and other entities in California and Nevada. During negotiations, a number of operational provisions were developed and evaluated. As each provision was considered, parts that were acceptable to all the parties became part of the proposed draft TROA, and those not acceptable to the parties were rejected. This agreement for the operation of Truckee River reservoirs is prescribed in section 205(a) of P.L. 101-618.

Without adoption of TROA, Truckee River reservoirs would continue to be operated as described under current operations in the near-term and, in the long-term, as under either No Action or LWSA. LWSA is an action alternative similar to No Action but with the addition of water supply options that may be authorized by State and local government agencies. The three alternatives also include projections by TMWA, city of Reno, city of Sparks, and Washoe County of different amounts of supplemental water from water rights acquisition, groundwater pumping and recharge, and water conservation practices that would be necessary under each alternative to meet future M&I demand in Truckee Meadows by 2033. In addition, the alternatives include projections by CDWR of different amounts of surface water and groundwater that would be used in the Lake Tahoe and Truckee River basins in California under each alternative.

## **No ACTION**

Under No Action, Truckee River reservoir operations would remain unchanged from current operations and would be consistent with existing court decrees, agreements, and regulations that currently govern surface water management (i.e., operating reservoirs and maintaining streamflows) in the Lake Tahoe and Truckee River basins. TMWA's existing programs for surface water rights acquisition and groundwater pumping for M&I use would continue. Groundwater pumping and water conservation in Truckee Meadows, however, would satisfy a greater proportion of projected future M&I demand than under current conditions. Groundwater pumping in California also would increase to satisfy a greater projected future M&I demand.

The apportionment of waters of Lake Tahoe and the Truckee River and Carson River basins conditionally approved by the Congress in section 204(b) and (c), respectively, of P.L. 101-618 would not become effective under No Action. No Action assumes that current surface water administrative policies would continue, including SWRCB's moratorium in effect since 1972, on acting on pending water right applications in the Lake Tahoe basin that would exceed the Compact's allocation or subsequent policy equivalent.

## **LWSA**

LWSA is similar to No Action but assumes additional water supplies would be authorized by State and local government agencies. It assumes that surface water management operations and storage facilities would be the same as described under No Action, but that groundwater pumping and M&I water conservation in Truckee Meadows and the upper Truckee River basin would differ.

As under No Action, the apportionment of the waters of Lake Tahoe and the Truckee River and Carson River basins agreed upon by California and Nevada, and conditionally approved by the Congress in section 204 of P.L. 101-618, would not become effective. It assumes that SWRCB would lift its moratorium and begin processing and approving some pending applications to appropriate surface water, allowing, by 2033, an estimated 1,200 acre-feet per year of surface water to replace groundwater otherwise used in the Truckee River basin in California. Total water use in California is anticipated to remain the same as under No Action.

## **TROA**

TROA is intended to (1) enhance water management flexibility, water quality, conditions for Pyramid lake fishes, reservoir recreational opportunities, and reservoir efficiency; (2) increase M&I drought supply, minimum reservoir releases, and the capacity for carryover storage; (3) allocate Truckee River water between California and Nevada; and (4) avoid water use conflicts as compared to No Action and LWSA. To this end, implementation of TROA would modify operations of Truckee River reservoirs while ensuring that existing

water rights are served and flood control and dam safety requirements are met. TROA would incorporate all requirements of any agreements concerning the operation of all reservoirs, including those of the Truckee River Agreement and the Tahoe-Prosser Exchange Agreement, and would become the sole operating agreement for all reservoirs.<sup>3</sup> Nothing in TROA, however, is intended to alter other applicable Federal or State laws. TROA would also contain provisions to implement the interstate allocation of Lake Tahoe and Truckee River waters between Nevada and California (section 204 of P.L. 101-618).

Truckee River reservoir operations under TROA would be similar to those under current operations, except that TROA would include Credit Water operations. Under TROA, many categories of Credit Waters would be stored and managed for the purposes of maintaining a M&I drought supply, conserving Pyramid Lake fishes, enhancing river quality and flow, and increasing reservoir recreation opportunities. Signatories to the Draft Agreement generally would be allowed to accumulate Credit Water by retaining or capturing in a reservoir water that would have otherwise been released from storage or passed through the reservoir to serve a downstream water right. Such storage could only take place after a transfer in accordance with State water law. Once accumulated, Credit Water would be classified by category with a record kept of its storage, exchange, and release. Credit Water would be retained in storage or exchanged among the reservoirs until needed to satisfy its beneficial use.

TROA also would provide procedures for facilitating and encouraging coordination of scheduled water releases and exchanges among the reservoirs. A scheduled release from one reservoir could be substituted for a release from another reservoir, and the respective water accounts in each reservoir would be credited and debited as appropriate. In these ways, existing water rights and storage rights would be served while streamflows and recreational pools could be enhanced, the potential for spills or need for precautionary releases could be reduced, and reservoir storage space would be used more effectively.

## **ANALYTICAL PROCESS**

A computer model, the Truckee River Operations Model (operations model), was used to assist in evaluating current conditions and the alternatives. The operations model used a 100-year (1901-2000) runoff record of monthly data for the Lake Tahoe, Truckee River, and Carson River basins to simulate monthly reservoir storage, releases, and spills; flows; and diversions and return flows under current conditions and the alternatives. Operations model results were compared to illustrate the capacity of each to manage water and satisfy demand and also to identify and evaluate the potential effects on resources in the study area.

---

<sup>3</sup> This sentence reflects the United States' proposed language as noted in section 5.A.1(a) of the Draft Agreement.

## **WATER RESOURCES**

The total amount of water in storage upstream of Farad is an indicator of the water supply in the Truckee River system to satisfy consumptive and nonconsumptive demands. Operations model results show that the total amount of water in storage likely would be greater under TROA than under No Action, LWSA, or current conditions, primarily in Prosser Creek, Stampede, and Boca Reservoirs.

Each alternative includes release targets to provide for environmental and recreational benefits. In dry hydrologic conditions, flows in Independence Creek, Little Truckee River, and Prosser Creek would be appreciably greater under TROA than under the other alternatives because of higher minimum flow releases and the ability to exchange Credit Water among the reservoirs. In addition, in dry hydrologic conditions, Truckee River flows through and downstream from Truckee Meadows would be greater under all alternatives than under current conditions because of the releases of Water Quality Water.

In the Newlands Project, Carson Division water demands would be served in wet, median, and dry hydrologic conditions. Lower Truckee River agricultural and M&I water demands would be met under all alternatives.

California's current M&I demand is satisfied under current conditions, and its future M&I demand would be satisfied under the alternatives. Truckee Meadows' M&I demands are met under current conditions, and operations model results show that the minimum year M&I supply would be greater under TROA than under No Action or LWSA.

## **GROUNDWATER**

Analysis shows no measurable change to the shallow aquifer near Truckee Meadows (adjacent to the Oxbow reach of the Truckee River) under any of the alternatives. Effects on the shallow aquifer in Truckee Meadows and establishment of a new groundwater equilibrium would vary among the alternatives and depend upon many local factors, such as the amount of groundwater pumping, recharge, and the localized groundwater flow gradients. Seepage loss from the Truckee Canal would be similar under all alternatives. With criteria established for new well construction, assumed limitations on groundwater use, and development of surface water drought supplies, TROA likely would have the least effect on future groundwater resources among the alternatives.

## **WATER QUALITY**

Overall, modeling shows that water quality would be better under TROA than under No Action or current conditions because flows would be higher and flow timing would be more favorable. Under TROA, water stored for water quality purposes would be released to improve riverine water quality in representative dry years, the most critical periods for aquatic resources. As a result, under TROA, Nevada temperature standards would be met much more often in representative dry years and somewhat more often in median years;

dissolved oxygen standards would be met much more often in representative dry years and about as often in median years. On rare occasions, in median years, water quality could be slightly worse under TROA than under No Action. However, the total water quality benefits realized in representative dry years under TROA would outweigh these effects. There are few water quality problems in representative wet years.

## **SEDIMENTATION AND EROSION**

No increased shoreline erosion at Lake Tahoe would occur under No Action, LWSA, or TROA; water quality would not be degraded; and the maximum elevation at which the lake is currently operated would not be exceeded.

Erosion and sediment transport in the Truckee River from Donner Creek to the Little Truckee River confluence would not differ significantly under any alternative.

In the Little Truckee River from Stampede Dam to Boca Reservoir, potentially more erosion could occur under No Action and LWSA than under current conditions. Under TROA, the potential for more sediment deposition could exist. However, because the reach is located downstream from Stampede Reservoir and is currently armored, erosion and sediment transport would not be affected. In the Spice and Lockwood reaches of the Truckee River, the potential for more sediment deposition could exist under No Action and LWSA than under current conditions. However, because no known sediment sources affect the Spice reach, sediment transport and erosion in this reach would not be affected. In the Lockwood reach, Steamboat Creek is an important potential source of sediment that could cause some increase in deposition. Very little change in erosion and sediment transport would occur under TROA because sediment transport capacity change does not vary substantially from current conditions.

In the Nixon reach, less erosion and sediment transport likely would occur under No Action and LWSA than under current conditions. With greater average annual flow, slightly more sediment transport could occur under TROA, but the effect would not be significant.

Truckee River delta dynamics would not be affected under TROA or the other alternatives.

## **BIOLOGICAL RESOURCES**

Conditions for fish in more reaches of the Truckee River and its tributaries, as well as in Prosser Creek, Stampede, and Boca Reservoirs, would be better under TROA than under LWSA, No Action, or current conditions. Foraging habitat for waterfowl and shorebirds at Stampede Reservoir would be better under TROA than under LWSA, No Action, or current conditions, but potential predation on Canada geese would be greater than under current conditions. Potential for enhancing riparian vegetation along some reaches of the Truckee River would be better under TROA than under LWSA or No Action in median hydrologic conditions and along all mainstem and tributary reaches in dry and extremely dry hydrologic conditions. Under TROA, riparian habitat along a few mainstem and tributary reaches would

be enhanced in wet and median hydrologic conditions and along most mainstem reaches in dry and extremely dry hydrologic conditions, when compared to LWSA, No Action, or current conditions.

Habitat conditions for Pyramid Lake fishes would be better under TROA than under LWSA, No Action, or current conditions. Habitat conditions for the prey base of the federally threatened bald eagle at Stampede and Boca Reservoirs also would be better under TROA than under LWSA, No Action, or current conditions. No significant, long-term effect would occur to Tahoe yellow cress, a Federal candidate species, under TROA, LWSA, or No Action. Other special status species would benefit from the riparian enhancement that TROA would provide compared to LWSA, No Action, or current conditions.

## **RECREATION**

Visitation at Prosser Creek, Stampede, and Boca Reservoirs generally would be greater under TROA than under No Action and current conditions, primarily because annual average water elevations would be higher under TROA, thus enhancing recreational access and ensuring a higher quality recreational experience. Visitation at Donner Lake would be negligibly (less than 1 percent) less under TROA than under current conditions, but greater than under either No Action or LWSA.

Effects on boat ramp usability would be the same in all hydrologic conditions at Pyramid Lake, and Prosser Creek and Lahontan Reservoirs under TROA, LWSA, and No Action. Boat ramps would be more usable in median hydrologic conditions at Donner Lake, in dry hydrologic conditions at Stampede Reservoir, and in wet hydrologic conditions at Boca Reservoir under TROA than under No Action and LWSA. Boat ramps would be less usable in dry hydrologic conditions at Donner Lake and in median hydrologic conditions at Boca Reservoir under TROA than under No Action. Usability of stationary docks at Donner Lake would not be significantly affected under any alternative during June, July, or August.

Effects on flows for fly fishing, rafting, and kayaking would be minimal under No Action, LWSA, and TROA. Because of the nature of spin/lure/bait fishing, and because anglers can and will still pursue their sport when flows are other than desired, none of the effects on flows for stream-based recreation under any of the alternatives is considered significant.

## **ECONOMIC ENVIRONMENT**

Economic model results show that recreation-based employment and income are about the same under the alternatives as under current conditions (differences of less than 1 percent). These differences would not significantly affect the overall regional economy.

Two analyses were conducted to show the economic effects of (1) meeting the M&I water demand in Truckee Meadows in 2033 and (2) transferring agricultural water rights in Truckee Meadows and the Truckee Division of the Newlands Project.

- For the first analysis, the economic model calculated the amount of employment and income that could be supported by the increase (approximately 36,000 acre-feet) in M&I water supplies from current conditions to meet the future M&I demand of 119,000 acre-feet in 2033 in Truckee Meadows under No Action, LWSA, and TROA. Model results show that same amount of employment and income associated with that future demand under the alternatives.
- For the second analysis, the economic model shows slightly (less than 1 percent) less employment and income in the study area under No Action, LWSA, and TROA than under current conditions. The economic model also shows only slightly less (less than 1 percent) employment and income under TROA than under No Action.

Analysis of operations model results shows that under TROA, hydroelectric power generation and gross revenues are about 6.0 percent less than under No Action and 5.5 percent less than under current conditions in wet hydrologic conditions; about 9.3 percent less than under No Action and about 17.0 percent less than under current conditions in median hydrologic conditions, and about 40.0 percent greater than under No Action and current conditions in dry hydrologic conditions. Reduced hydroelectric generation, if any, resulting from implementation of TROA would be compensated consistent with the provisions of TROA.

Based on information provided by TMWA, groundwater usage to meet future M&I water demand would vary under current conditions, No Action, LWSA, and TROA. Groundwater production and recharge has associated capital, operation, and maintenance costs. Based on a comparison of the annual groundwater costs for each of the alternatives, the least cost alternative is TROA (\$2.15 million), followed by No Action (\$3.48 million), and LWSA (\$4.70 million), all more costly than current conditions (\$1.52 million). Under No Action and LWSA, the higher annual costs are due to greater groundwater pumping. Groundwater pumping not only would be greater under LWSA than under current conditions and TROA, but because of groundwater recharge provisions for this alternative, it has greater future capital investments.

## **SOCIAL ENVIRONMENT**

Overall, effects on the social environment indicators of population, urbanization of Truckee Meadows, and air quality would be the same under TROA and LWSA as under No Action.

In the future, under all alternatives, the study area is projected to experience a steadily increasing population, an expansion of M&I water use, and a decline in agricultural-based living. Between 2000 and 2033, the population of Truckee Meadows is projected to increase from 284,147 to 440,874. Under the alternatives, about 13,368 acre-feet of agricultural water rights would be transferred to M&I use in response to increasing population until demand in the Truckee Meadows service area reaches 119,000 acre-feet. Local and State governments would continue to implement regulatory and monitoring programs to maintain compliance with air quality standards.

## **CULTURAL RESOURCES**

Projected effects on cultural resources under TROA would be minimal, depending on location. Five percent fewer cultural resources at lakes and reservoirs would be affected under TROA than under current conditions and the other alternatives. With rivers and creeks, however, expectations are different. Operations model results show that 3 percent more sites along the rivers and creeks would be affected under TROA (and current conditions) than under the No Action or LWSA. Actual effects for sites along these rivers and creeks could be different and, if the numbers were higher, would require field research and validation for possible adverse effects.

## **INDIAN TRUST RESOURCES**

Indian trust resources are legal interests in property or natural resources held in trust by the United States for Indian Tribes or individuals. For the Pyramid Tribe, lower Truckee River flow and discharge to Pyramid Lake would be greater under TROA. With increased flow and the capacity to manage such water, TROA would assist in improving lower river water quality; enhance the elevation of Pyramid Lake; enhance the riparian canopy in and stabilize the lower river; enhance recreational opportunities at Pyramid Lake; enhance spawning opportunities for cutthroat trout; and enhance river habitat for Pyramid Lake fishes. In addition, the exercise of lower Truckee River agricultural and M&I water rights, including those of the Pyramid Tribe, would continue to be satisfied under all alternatives. For Reno-Sparks Indian Colony, implementation of any of the action alternatives would have no effect on the exercise of Truckee River water rights. For the Fallon Paiute-Shoshone Tribe, the Carson Division water supply is minimally affected under any of the action alternatives and the Tribe would receive a full water supply as frequently under TROA as under No Action. For the Washoe Tribe, TROA would not affect flows of the Carson River and would have no effect on land and water resources in the Lake Tahoe basin.

## **GROWTH-INDUCING IMPACTS**

Although sources of water or mechanisms to meet water demands might differ among the alternatives, population growth and resulting water demand are projected to be the same under No Action, LWSA, and TROA. The projected changes are within the parameters of planning for growth within the study area, including land use, transportation, housing, schools, public services, environmental resources, and infrastructure planning. Therefore, implementation of TROA would not be growth inducing in the Lake Tahoe or Truckee River basins.

## **ENVIRONMENTAL JUSTICE**

Implementing TROA would not have an adverse human health or environmental effect as defined by environmental justice policies and directives.

## **OTHER EFFECTS**

Because of exchange and storage agreements that are components of TROA, a more assured long-term drought water supply for Truckee Meadows would be obtained, and improved flow conditions would be possible for Pyramid Lake fishes and aquatic species in general. California's water supply from the Lake Tahoe and Truckee River basins is established, which would have the effect of making M&I supplies more secure, and could be utilized in the short run to improve environmental conditions in the Truckee River.

## **CONSULTATION AND COORDINATION**

Concurrent with preparation of this document, agency coordination and consultation have been or are in the process of being conducted in accordance with the Fish and Wildlife Coordination Act, Endangered Species Act of 1973, as amended, and National Historic Preservation Act of 1966. Additionally, consultation with Indian tribes in the study area has included the Pyramid Tribe, Reno-Sparks Indian Colony, Fallon Paiute Shoshone Tribe, and Washoe Tribe of Nevada and California.

Input to the decisionmaking process came from several sources, including the policy, legal, and technical representatives of the negotiating parties of the Agreement and the public, including interest groups in California and Nevada.

Public involvement is a process by which interested and affected individuals, organizations, agencies, and governmental entities are consulted and included in the decisionmaking process. Public involvement is an ongoing effort.

## **SUMMARY OF EFFECTS**

Table 1 summarizes the effects of the alternatives on the resources of the study area. The table presents relative differences between the action alternatives and No Action, and between all the alternatives and current conditions. Current conditions data for some indicators, including population, employment, and income, are presented in the table to provide a specific basis of comparison with the alternatives. Current conditions are described in chapter 3, under "Affected Environment," for each resource. No significant adverse effects are expected to occur under TROA.

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
<b>Water resources</b>			
<b>Reservoir storage and releases</b>			
Total amount of water in storage upstream of Farad	Slightly less than under current conditions.	Same as under No Action.	Much greater than under No Action and current conditions.
Lake Tahoe	Slightly less storage and same releases as under current conditions.	Same storage and releases as under No Action.	Similar storage and much higher May-June releases than under No Action and current conditions.
Donner Lake	Same storage and releases as under current conditions.	Same storage and releases as under No Action.	Similar storage as under No Action and much higher September-October releases than under No Action.
Prosser Creek Reservoir	<p>Wet hydrologic conditions: same storage and releases as under current conditions.</p> <p>Median hydrologic conditions: greater July–September storage; lower May–June releases; much higher October releases than under current conditions.</p> <p>Dry hydrologic conditions: much greater January–December storage; lower May–June releases; much higher October releases than under current conditions.</p>	Same storage and releases as under No Action in all three hydrologic conditions.	<p>Wet hydrologic conditions: same storage and releases as under No Action.</p> <p>Median hydrologic conditions: greater April–September storage; lower May–June releases; much higher September–October releases than under No Action and current conditions.</p> <p>Dry hydrologic conditions: much greater January–December storage; lower May–June releases; much higher September–October releases than under No Action and current conditions.</p>
Independence Lake	Same storage and releases as under current conditions.	Same storage and releases as under No Action.	<p>Wet and median hydrologic conditions: same storage and releases as under No Action.</p> <p>Dry hydrologic conditions: greater July–September storage; less November–June storage; higher May–September releases than under No Action and current conditions.</p>

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Stampede Reservoir	<p>Wet hydrologic conditions: greater August–September storage and same releases as under current conditions.</p> <p>Median hydrologic conditions: less January–December storage and same releases as under current conditions.</p> <p>Dry hydrologic conditions: greater January–December storage and higher March and July releases than under current conditions.</p>	Same storage and releases as under No Action.	<p>Wet hydrologic conditions: greater May–September storage and higher September–December releases than under No Action and current conditions.</p> <p>Median hydrologic conditions: much greater January–December storage; lower November–August releases; much higher October releases than under No Action and current conditions.</p> <p>Dry hydrologic conditions: much greater January–December storage and releases than under No Action and current conditions.</p>
Boca Reservoir	Same storage and releases as under current conditions.	Same storage and releases as under No Action.	<p>Wet hydrologic conditions: less August and greater October–December storage than under No Action.</p> <p>Median hydrologic conditions: greater August–March storage than under No Action.</p> <p>Dry hydrologic conditions: greater January–December storage than under No Action.</p>
Pyramid Lake	Ending elevation and inflow lower than under current conditions.	Ending elevation, and inflow lower than under No Action and current conditions.	Ending elevation and inflow higher than under No Action and current conditions.

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Lahontan Reservoir	<p>Wet hydrologic conditions: slightly greater September–February storage; same releases as under current conditions.</p> <p>Median and dry hydrologic conditions: less January–December storage; lower April–September releases than under current conditions.</p>	Same as storage and releases under No Action.	Same as storage and releases under No Action.
<b>Truckee River flow</b>			
Farad	Slightly lower than under current conditions.	Same as under No Action.	<p>Wet hydrologic conditions: higher December–June and August–September flows than under No Action and current conditions.</p> <p>Median hydrologic conditions: lower June–January flows and higher March–May flows than under No Action and current conditions.</p> <p>Dry conditions: lower December–July flows and higher September–October flows than under No Action and current conditions.</p>
Vista	Slightly lower than under current conditions.	Same as under No Action.	<p>Wet hydrologic conditions: slightly higher January–May flows than under No Action and current conditions.</p> <p>Median hydrologic conditions: higher April–October flows and lower November–March flows than under No Action and current conditions.</p> <p>Dry hydrologic conditions: lower November–June flows and higher July–October flows than under No Action and current conditions.</p>

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Nixon	<p>Wet and median hydrologic conditions: same as under current conditions.</p> <p>Dry hydrologic conditions: higher August–February flows than under current conditions.</p>	Same as under No Action.	<p>Wet hydrologic conditions: slightly higher December–July flows than under No Action and current conditions.</p> <p>Median hydrologic conditions: higher April–October flows and lower November–March flows than under No Action and current conditions.</p> <p>Dry hydrologic conditions: higher August–February flows than under No Action and current conditions.</p>
<b>Exercise of water rights to meet demand</b>			
Agricultural	<p>Truckee Meadows: much less demand and a greater percentage of demand met in minimum supply year than under current conditions.</p> <p>Newlands Project: much less demand and less percentage of demand met in minimum supply year than under current conditions.</p> <p>Lower Truckee River basin: much greater demand and same percentage of demand met in minimum supply year as under current conditions.</p>	<p>Truckee Meadows: same demand as under No Action and a greater percentage of demand met in minimum supply year than under current conditions.</p> <p>Newlands Project: same demand and slightly less percentage of demand met in minimum supply year than under No Action; much less demand and less percentage of demand met in minimum supply year than under current conditions.</p> <p>Lower Truckee River basin: same as under No Action.</p>	<p>Truckee Meadows: much less demand than under No Action and current conditions and greater percentage of demand met in minimum supply year than under No Action and current conditions.</p> <p>Newlands Project: same demand and slightly greater percentage of demand met in the minimum supply year than under No Action; much less demand and less percentage of demand met in minimum supply year than under current conditions.</p> <p>Lower Truckee River basin: same as under No Action.</p>

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
M&I	<p>Lake Tahoe basin: much greater demand and same percentage of demand met in minimum supply year as under current conditions.</p> <p>Truckee River basin in California: much greater demand and same percentage of demand met in minimum supply year as under current conditions.</p> <p>Truckee Meadows: much greater demand and less percentage of demand met in minimum supply year than under current conditions.</p>	<p>Lake Tahoe basin: same as under No Action.</p> <p>Truckee River basin in California: same as under No Action.</p> <p>Truckee Meadows: same demand and greater percentage of demand met in minimum supply year than under No Action; much greater demand and less percentage of demand met in minimum supply year than under current conditions.</p>	<p>Lake Tahoe basin: same as under No Action.</p> <p>Truckee River basin in California: same as under No Action.</p> <p>Truckee Meadows: same demand and greater percentage demand met in minimum supply year than under No Action; much greater demand and less percentage of demand met in minimum supply year than under current conditions.</p>
Groundwater			
Recharge of aquifer adjacent to Truckee River in the Oxbow reach	Slightly less than under current conditions.	Same as under No Action.	Slightly more than under No Action; same as under current conditions.
Recharge of the shallow aquifer in Truckee Meadows	Slightly less than under current conditions	Similar to No Action	Possibly less than under No Action depending on current land use.
Recharge of shallow aquifer near Truckee Canal due to seepage loss	Less than under current conditions.	Similar to No Action.	Similar to No Action.
Well pumping in the shallow aquifer	Slightly less than under current conditions.	Same as under No Action, except slightly more in dry hydrologic conditions.	Slightly less than under current conditions, except in dry hydrologic conditions.
Water quality			
Truckee River flows downstream from TTSA, downstream from Reno, and into Pyramid Lake	Slightly more than under current conditions in dry hydrologic conditions.	Same as under No Action.	Slightly more than under No Action or current conditions in dry hydrologic conditions.
Days that temperature standards are violated downstream from Reno	Much more than under current conditions in representative dry years.	Same as under No Action.	Much less than under No Action; similar to current conditions.

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Days that dissolved oxygen standards are violated downstream from Reno	Much less than under current conditions.	Same as under No Action.	Much less than under No Action and current conditions.
Total dissolved solids, total nitrogen, and total phosphorus loadings to Pyramid Lake	About the same as under current conditions, except slightly less in representative dry years.	Same as under No Action.	Cumulatively about the same as under No Action and current conditions.
<b>Sedimentation and erosion</b>			
Shoreline erosion at Lake Tahoe	No man-made induced degradation of any water quality parameters	Same as under No Action.	Same as under No Action.
Stream channel erosion and sediment transport capacity change	Truckee River from Donner Creek to the Little Truckee River confluence: same as or less than under current conditions.	Truckee River from Donner Creek to the Little Truckee River confluence: same as under No Action.	Truckee River from Donner Creek to the Little Truckee River confluence: about the same as under No Action.
	Little Truckee River from Stampede Dam to Boca Reservoir: same as under current conditions.	Little Truckee River from Stampede Dam to Boca Reservoir: same as under No Action.	Little Truckee River from Stampede Dam to Boca Reservoir: no overall effect.
	Spice: about the same as under current conditions.	Spice: same as under No Action.	Spice: no overall effect.
	Lockwood: less sediment transport and more deposition than under current conditions.	Lockwood: Same as under No Action.	Lockwood: same as under current conditions; no overall effect compared to No Action.
	Nixon: about the same as under current conditions.	Nixon reach: same as under No Action.	Nixon reach: no overall effect.
Truckee River delta dynamics at Pyramid Lake	Same as under current conditions.	Same as under No Action.	Same as under No Action.
<b>Biological resources</b>			
Fish in rivers and tributaries	Better conditions for fish in a few reaches; significant adverse effects in some reaches compared to current conditions.	Same as under No Action.	Significant beneficial effects in many reaches compared to No Action and current conditions.
Fish in lakes and reservoirs	Significant beneficial effect on fish in Prosser Creek Reservoir compared to current conditions.	Same as under No Action.	Significant beneficial effects on fish in Prosser Creek, Stampede, and Boca Reservoirs compared to No Action and current conditions.

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Waterfowl and shorebirds	Same as under current conditions.	Same as under No Action.	Significant beneficial effect at Stampede Reservoir compared to No Action and current conditions.
Riparian habitat and associated species	Wet and median hydrologic conditions: significant beneficial effects in a few reaches compared to current conditions.  Dry and extremely dry hydrologic conditions: significant beneficial effects in most reaches compared to current conditions.	Same as under No Action.	Median hydrologic conditions: significant beneficial effects in a few reaches compared to No Action and current conditions.  Dry and extremely dry hydrologic conditions: significant beneficial effects in all reaches compared to No Action and current conditions.
Endangered, threatened, and other special status species	Cui-ui and LCT: significant adverse effects compared to current conditions.  Bald eagle at Stampede Reservoir: significant beneficial effects compared to current conditions.  Tahoe yellow cress: same as under current conditions.  American white pelican: significant adverse effects compared to current conditions.  Other special status species: see riparian habitat and associated species.	Cui-ui and LCT: Same as under No Action.  Bald eagle at Stampede Reservoir: significant adverse effects compared to No Action.  Tahoe yellow cress: same as under No Action.  American white pelican: same as under No Action.  Other special status species: see riparian habitat and associated species.	Cui-ui and LCT: significant beneficial effects compared to No Action and current conditions.  Bald eagle at Stampede and Boca Reservoirs: significant beneficial effects compared to No Action and current conditions.  Tahoe yellow cress: same as under No Action.  American white pelican: significant beneficial effects compared to No Action and current conditions.  Other special status species: see riparian habitat and associated species.
<b>Recreation</b>			
Seasonal recreation visitation	Same as under current conditions, except slightly less at Donner Lake in median hydrologic conditions.	Same as under No Action, except slightly more at Donner Lake in median hydrologic conditions.	Same as under No Action, except more at Donner Lake and Prosser Creek, Stampede, and Boca Reservoirs in some hydrologic conditions.

Table 1.—Summary of effects of alternatives on resources

	No Action	LWSA	TROA
Boat ramp usability	Same as under current conditions, except slightly more usable at Boca Reservoir in wet hydrologic conditions.	Same as under No Action.	Same as under No Action and current conditions, except slightly more or less usable at Donner Lake and Boca Reservoir in certain hydrologic conditions.
Suitability of flows for fly fishing	Same as under current conditions, with a few exceptions.	Same as under No Action.	Same as under No Action.
Suitability of flows for spin/lure/bait fishing	Desired flows would occur more often in the Little Truckee River from Independence Creek to Stampede Reservoir and in the Trophy reach in wet hydrologic conditions and less often in the Mayberry, Oxbow, and Spice reaches in dry hydrologic conditions than under current conditions.	Same as under No Action, except desired flows would occur more often in the Mayberry, Oxbow, and Spice reaches in median hydrologic conditions.	Desired flows would occur more often in Prosser Creek in median hydrologic conditions and in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions and less often in several reaches, primarily in wet hydrologic conditions, than under No Action and current conditions.
Suitability of flows for rafting	Same as under current conditions.	Same as under No Action.	Same as under No Action, except that desired flows would occur less often in the Truckee River from Lake Tahoe to Donner Creek in wet hydrologic conditions and more often in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions.
Suitability of flows for kayaking	Same as under current conditions.	Same as under No Action.	Same as under No Action, except that desired flows would occur less often in the Truckee River from Lake Tahoe to Donner Creek in wet hydrologic conditions and more often in the Mayberry, Oxbow, and Spice reaches in wet hydrologic conditions.

Table 1.—Summary of effects of alternatives on resources

	Current conditions	No Action	LWSA	TROA
<b>Economic environment</b>				
Recreation-based employment and income	Baseline (California) Employment: 16,900 jobs Income: \$344 million	About the same employment and income as under current conditions (differences of less than 1 percent).	Same as under No Action.	Same as under No Action.
Employment and income affected by changes in water supply	Baseline (Nevada) Employment: 199,700 jobs Income: \$4.8 billion	About the same employment and income as under current conditions (differences of less than 1 percent).	Same as under No Action.	Same as under No Action.
Hydropower generation and revenues	Wet hydrologic conditions: 65,548 MWh \$1.57 million	Wet hydrologic conditions: less than 1 percent greater than under current conditions.	Wet hydrologic conditions: same as under No Action.	Wet hydrologic conditions: 3.7 percent less than under No Action; 3.6 percent less than under current conditions.
	Median hydrologic conditions: 51,485 MWh \$1.23 million	Median hydrologic conditions: less than 1 percent less than under current conditions.	Median hydrologic conditions: less than 1 percent less than under No Action or current conditions.	Median hydrologic conditions: 5.9 percent less than under No Action; 6.1 percent less than under current conditions.
	Dry hydrologic conditions: 18,106 MWh \$0.43 million	Dry hydrologic conditions: 2.3 percent less than under current conditions.	Dry hydrologic conditions: 1.3 percent less than under No Action; 4 percent less than under current conditions.	Dry hydrologic conditions: 58 percent greater than under No Action; 55 percent greater than under current conditions.
Total annual groundwater development costs	\$1,520,395	\$3,348,102 or 120 percent greater than under current conditions.	40 percent greater than under No Action; \$4,696,483 or 200 percent greater than under current conditions.	35 percent less than under No Action; \$2,151,982 or 42 percent greater than under current conditions.

Table 1.—Summary of effects of alternatives on resources

Indicator	Current conditions	No Action	LWSA	TROA
<b>Social environment</b>				
Population of Truckee Meadows	284,147	440,874	440,874	440,874
Urbanization of Truckee Meadows	<p>M&amp;I water supply of 83,140 acre-feet.</p> <p>Baseline employment: 199,762 jobs</p> <p>Baseline income \$4.45 billion</p>	<p>Change in M&amp;I water supply to meet additional 36,000 acre-foot demand (total 119,000 acre-foot demand) would support 73,000 full- and part-time jobs and \$1.3 billion in personal income.</p> <p>Transfers of agricultural water rights would result in about 234 fewer jobs, and about \$3.1 million less in income (differences of less than 1 percent from baseline).</p>	Same as under No Action.	About the same as under No Action (differences in employment and income of less than 1 percent from baseline).
Air Quality	Regulatory programs and monitoring in place to comply with air quality criteria standards.	Same as under current conditions.	Same as under No Action.	Same as under No Action.
<b>Cultural resources</b>				
	Current	No Action	LWSA	TROA
Number of affected resources at lakes and reservoirs and percent [ ] of total recorded resources affected	100 [38]	99 [38]	99 [38]	88 [33]
Number of affected cultural resources along river and stream reaches and percent [ ] of total recorded resources affected	18 [11]	9 [6]	9 [6]	18 [11]